REMARKS

Claims 1-26 are pending in the above identified application. The Examiner has rejected Claims 1-26. Applicants have amended the specification to conform references to the Figures (e.g., Figure 1A) in the text with the figure labels and to correct some grammatical errors. Applicants have further amended Figures 2A and 5F to correct minor drafting errors. Claims 1, 3, 5, 6, 22, 25 and 26 have been amended and new claims 27 and 28 have been added. No new matter has been added with these amendments.

Applicants respectfully traverse the rejections of claims 1-26 and request reconsideration and reexamination of this application.

Claim Rejections Under 35 U.S.C. § 103

The Examiner has rejected claims 1-26 "under 35 U.S.C. 103(a) as being unpatentable over Lemoff et al. (either U.S.P. No. 6, 198,864 or EP 1004907) in view of Nosu et al., U.S.P. No.4,244,045." (Office Action, p. 2).

However, Lemoff et al. ("Lemoff") does not teach "that light entering the mirror-filter block from the lens block is wavelength separated through a plurality of reflections between a flat mirror surface and a plurality of filters coupled between the lens block and a lens array," as is recited in claim 1, or "separating each wavelength of light from the beam of light by reflecting the beam of light between a flat mirror and a plurality of optical filters, each of the plurality of optical filters passing light in a narrow region about a specified wavelength," as is recited in claim 22, or "reflecting light between the plurality of light sources and a flat reflecting surfaces so as to combine the light from each of the plurality of light sources into a single beam," as is recited in claim 25, or "that light input to the collimating lens is separated into wavelengths

associated with the set of filters by reflecting the light between the flat mirror and the set of filters," as is recited in claim 26. Nosu et al. (Nosu) does not cure the defects in the teachings of Lemoff.

Further, there is no motivation to combine Lemoff with Nosu as is suggested by the Examiner because Lemoff teaches away from "a collimating lens coupled between the lens block and the optical fiber," as is recited in claim 1, "collimating the beam of light with a collimating lens," as is recited in claim 22, "collimating the light from each of the plurality of light sources with a plurality of focusing lenses," as is recited in claim 25, or "that light input to the collimating lens is separated into wavelengths associated with the set of filters by reflecting the light between the flat mirror and the set of filters," as is recited in claim 26.

I. The combination of Lemoff et al. with Nosu et al. does not teach all of the elements of any of claims 1-26.

Lemoff teaches an invention that "relates generally to wavelength division multiplexed optical communication systems and more particularly to an optical wavelength division demultiplexer." (Lemoff, col. 1, lines 4-6). In particular, Lemoff teaches that

> [a] demultiplexer in accordance with the invention includes an optically transparent structure that *utilizes focusing relay mirrors to relay a multi-wavelength light beam among laterally arranged wavelength-specific interference filters*, with each filter separating out a specific wavelength component from the multi-wavelength beam. The relay mirrors are focusing mirrors, so that the demultiplexer can be operated with a non-collimated light beam in a manner that controls the tendency of such a beam to have a large angle of divergence, while taking advantage of the small beam diameter in order to create a demultiplexer with greater miniaturization.

(Lemoff, col. 2, lines 26-37, emphasis added). Therefore, in accordance with Lemoff, focusing relay mirrors relay light between the filters to separate specific wavelength components.

The Examiner points out that lens block 80 shown in the embodiment of Lemoff's invention shown in Figure 3 of Lemoff has a flat mirrored surface. Lemoff teaches that

> FIG. 3 is another alternative input arrangement in which like elements are numbered as in FIGS. 1 and 2. In the arrangement of FIG. 3, the input surface is an objective lens 82 that is integrated into the surface of the MOB 14. The objective lens is preferably an aspheric convex surface that is shaped such that the light that reaches the first interference filter 20 has the desired spatial and angular characteristics. Because the light is being focused by the objective lens, a flat integrated mirror 80 can be utilized to direct the light from the objective lens to the first filter. Alternatively, the objective lens can be arranged such that the light propagates directly from the objective lens to the first filter. As with FIGS. 1 and 2, mechanical features 43 can be formed in the MOB to register and align the optical fiber 42 with the input surface of the MOB.

(Lemoff, col. 5, lines 53-67). Therefore, <u>the flat mirror directs light onto the first filter, after which focusing relay mirrors direct the light onto subsequent filters as is discussed above.</u>

<u>Therefore, Lemoff does not teach "that light entering the mirror-filter block from the lens block is wavelength separated through a plurality of reflections between a flat mirror surface and a plurality of filters coupled between the lens block and a lens array," as is recited in claim 1, or "separating each wavelength of light from the beam of light by reflecting the beam of light between a flat mirror and a plurality of optical filters, each of the plurality of optical filters passing light in a narrow region about a specified wavelength," as is recited in claim 22, or "reflecting light between the plurality of light sources and a flat reflecting surfaces so as to combine the light from each of the plurality of light sources into a single beam," as is recited in claim 25, or "that light input to the collimating lens is separated into wavelengths associated with the set of filters by reflecting the light between the flat mirror and the set of filters," as is recited in claim 26.</u> Nosu et al. does not cure the defects in the teachings of Lemoff.

II. There is no motivation to combine Lemoff with Nosu as suggested by the Examiner

The Examiner states that "Lemoff (either reference) does not teach the use of collimating lenses at the optical input in an optical multiplexer/demultiplexer setting." (Office Action, page 3). Lemoff, as is suggested by the Examiner, does not teach "a collimating lens coupled between the lens block and the optical fiber," as is recited in claim 1, "collimating the beam of light with a collimating lens," as is recited in claim 22, "focusing the single beam onto an optical fiber with a collimating lens," as is recited in claim 25, or "injection molding a lens block, the lens block including lens positions for a collimating lens . . . ," as is recited in claim 26.

The Examiner also states, however, that "Nosu et al. teaches (Figs. 1-17) an optical multiplexer/demultiplexer device which uses collimating lenses 40 with an optical fiber 100 for collimating light into an optical multiplexer/demultiplexer setting." *Id.*

However, Lemoff teaches away from utilizing a collimating lens at the optical input and therefore there is no motivation to combine Lemoff with Nosu as is suggested by the Examiner. Lemoff teaches that

> The relay mirrors are focusing mirrors, so that the demultiplexer can be operated with a non-collimated light beam in a manner that controls the tendency of such a beam to have a large angle of divergence, while taking advantage of the small beam diameter in order to create a demultiplexer with greater miniaturization.

(Lemoff, col. 1, lines 31-37). Further, Lemoff teaches that "[w]hen implemented in a preferred four-channel WDM communications system, light from an optical fiber is coupled directly into the main optical block through the input surface without the light being collimated." Further, in listing the advantages of the Lemoff invention, Lemoff states that "[b]ecause the demultiplexer uses integrated focusing reflectors in a folded geometry, the demultiplexer occupies less space

than prior designs while providing the same performance." (Lemoff, col. 4, lines 16-19). Additionally, Lemoff teaches that "[i]n brief, when implemented in a four-channel WDM communications system, light is coupled from an optical fiber 42 into the MOB through the input surface 38 without the light being collimated." (Lemoff, col. 4, lines 48-51). Further, "[i]t is important to note that the relay mirrors are concave mirrors, so that the non-collimated and diverging light beam is continuously refocused while propagating between adjacent filters, allowing the demultiplexer to be extremely small as compared to prior art bulk optical demultiplexers for non-collimated beams." (Lemoff, col. 5, lines 2-7).

Therefore, because Lemoff teaches away from utilizing a collimator lens, there is no motivation to combine Lemoff with Nosu to teach "a collimating lens coupled between the lens block and the optical fiber," as is recited in claim 1, "collimating the beam of light with a collimating lens," as is recited in claim 22, "focusing the single beam onto an optical fiber with a collimating lens," as is recited in claim 25, or "injection molding a lens block, the lens block including lens positions for a collimating lens . . . ," as is recited in claim 26.

III. Summary

Claims 1, 22, 25 and 26 are therefore allowable over the combination of Lemoff and Nosu for at least the reasons discussed above. Claims 2-21 depend from claim 1 and are allowable over the combination of Lemoff and Nosu for at least the reasons discussed above with respect to claim 1. Claims 23 and 24 depend from claim 22 and are allowable over Lemoff and Nosu for at least the reasons discussed above with respect to claim 22.

In view of the foregoing amendments and remarks, Applicant respectfully requests the reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

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By: Gary J. Edwards
Reg. No. 41,008

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Marked-Up Version of Amended Claims 1, 3, 5, 6, 22, 25 and 26

1. (Amended) An optical component , comprising:

a lens block optically coupled to an optical fiber;

a collimating lens coupled between the lens block and the optical fiber;

a mirror-filter block positioned with respect to the lens block so that light entering the mirror-filter block from the lens block is wavelength separated through a plurality of reflections between a flat mirror surface and a plurality of filters[, the plurality of filters being] coupled between the lens block and [the mirror-filter block]a lens array;

a plurality of focusing lenses formed on the lens array, each of the plurality of focusing lenses optically coupled to one of the plurality of filters.

3. (Amended) The component of Claim 1, wherein the plurality of focusing lenses of the lens array are integrally formed [with]on the lens block.

5. (Amended) The component of Claim 1, wherein each of the plurality of focusing lenses focuses light received from one of the plurality of filters onto one of a plurality of optical detectors.

6. (Amended) The component of Claim 1, wherein each of the plurality of focusing lenses focuses light from one of the plurality of filters onto an optical fiber.

22. (Amended) A method of demultiplexing a beam of light transmitted by an optical fiber, comprising:

collimating the beam of light with a collimating lens;

separating each wavelength of light from the beam of light [be]by reflecting the beam of light between a flat mirror and a plurality of optical filters, each of the plurality of optical filters passing light in a narrow region about a specified wavelength;

propagating light passed through each of the plurality of optical filters substantially along the optical axis of one of a plurality of focusing lenses;

focusing light from each of the plurality of optical filters with one of the plurality of focusing lenses.

25. (Amended) A method of multiplexing light, comprising:

receiving light from a plurality of light sources, each of the plurality of light sources transmitting an optical signal with light of a specified wavelength;

collimating the light from each of the plurality of light sources with a plurality of focusing lenses;

transmitting the light from each of the plurality of light sources into an optical filter that passes light from one of the plurality of light sources and reflects light from the remainder of the plurality of light sources;

reflecting light between the plurality of light sources and a flat reflecting [surfaces]surface so as to combine the light from each of the plurality of light sources into a single beam;

focusing the single beam onto an optical fiber with a collimating lens.

26. (Amended) A method of forming an optical component comprising:

injection molding a lens block, the lens block including lens positions for a collimating lens and a plurality of focusing lenses placed such that light incident on the collimating lens and the plurality of focusing lenses is parallel with an optical axis of each of the collimating lens and the plurality of focusing lenses;

preparing a mirror-filter block, the mirror-filter block having flat [surfaces, one of which is a reflecting surface]mirror;

positioning the mirror-filter block relative to the lens block;

positioning a set of filters between the lens block and the mirror-filter block so that light input to the collimating lens is separated into wavelengths associated with the set of filters by reflecting the light between the flat mirror and the set of filters;

epoxying the lens block, the mirror-filter block, and the filters to form the [multiplexer/demultiplexer]optical component.